

component and the circuit board is hardened by pressurizing the electronic component against the circuit board with heat applied to the anisotropic conductive film sheet (10) while concurrently correcting the warp of the circuit board, so that the electronic component is bonded to the circuit board.

7. An electronic component mounting method as claimed in any one of claims 1 through 6, wherein the gold bump that has an approximately conically shaped tip is formed on the electrode of the electronic component by means of the capillary that has a chamfer angle ( $\theta_c$ ) of not greater than  $100^\circ$  when a gold ball (96a) is formed by an electric spark at a tip of a gold wire (95) similarly to the wire bonding in forming the bump on the electronic component and a tip shape provided with no flat portion to be brought in contact with the gold ball.

8. An electronic component mounting method comprising:

forming a ball (96, 96a) at a tip of a metal wire (95) by an electric spark similarly to wire bonding and forming a bump (3, 103) on an electrode (2) of an electronic component (1) by means of a capillary (93, 193) by the formed ball;

mounting the electronic component on a circuit board (4) by aligning in position the electrode of the

electronic component with an electrode (5) of the board with interposition of an anisotropic conductive layer (10) in which an insulating resin mixed with an inorganic filler is mixed with a conductive particle (10a) without leveling the formed bump;

subsequently hardening the insulating resin of the anisotropic conductive layer interposed between the electronic component and the circuit board while correcting warp of the board with a pressure P1 applied as a pressure force to the electronic component against the circuit board and heat applied from an upper surface of the electronic component by means of a tool (8) heated to a specified temperature; and

subsequently bonding the electronic component to the circuit board while alleviating a stress when hardening the insulating resin of the anisotropic conductive layer by reducing the pressure force to a pressure P2 lower than the pressure P1 after a lapse of a specified time, so that the electrode of the electronic component is electrically connected with the electrode of the circuit board.

9. An electronic component mounting method as claimed in claim 8, wherein the pressure P1 is not smaller than 20 gf per bump, and the pressure P2 is not greater than one-half the pressure P1.

10. An electronic component mounting apparatus

comprising:

5 a device (7, 109, 200, 201) for sticking an anisotropic conductive layer (10), in which an insulating resin mixed with an inorganic filler is mixed with a conductive particle (10a), to an electrode (5) of a circuit board (4) or an electronic component (1);

10 a device (93, 193) for forming a bump (3, 103), without leveling, by forming a ball (96, 96a) by an electric spark at a tip of a metal wire (95) on an electrode (2) of the electronic component (1) similarly to wire bonding and forming by thermocompression-bonding this to the electrode of the board with supersonic waves by means of a capillary (93, 193);

15 a device (600) for mounting the electronic component on the electrode (5) of the circuit board (4) through positional alignment; and

20 a device (8, 9) for bonding the electronic component to the circuit board by hardening the insulating resin of the anisotropic conductive layer interposed between the electronic component and the circuit board while correcting warp of the board with a pressure force of not smaller than 20 gf per bump applied to the electronic component against the circuit board and with heating by means of the tool (8), so that the electrode of the  
25 electronic component is electrically connected with the